

REMARKS

INTRODUCTION

In view of the following, reconsideration of the allowability of all pending claims is respectfully requested.

Claims 22-25 have been allowed and claims 2-4, 7-9, and 21 have been indicated as including allowable subject matter, but stand objected for depending from rejected base claims.

REJECTION UNDER 35 USC 103

Claims 1, 5, 6, 10-13 and 18-20 stand rejected under 35 USC § 103(a) as being obvious over Walker et al., U.S. Patent No. 6,561,643. This rejection is respectfully traversed.

By way of review and as an example, independent claim 1 sets forth "[a] media manipulation apparatus, comprising: a media type detector including, a light source to illuminate a media; a specular light sensor, and a first light sensor, wherein the first light sensor has a higher light flux capability compared to the specular light sensor; and a determination unit to determine a media type of the media based on a signal ratio of a detected specular light sensor intensity and a detected first light sensor intensity."

Specifically, independent claim 1 sets forth that the claimed first light sensor has a higher light flux capability compared to the claimed specular light sensor.

The Office Action has indicated that Walker et al. discloses a light source, a first light sensor, and a specular light sensor.

It is further noted that the Office Action acknowledges that Walker et al. discloses that the apertures for the specular and diffuse light sensors have similar dimensions.

However, the Office Action sets forth that regardless of Walker et al. having similar dimensioned light sensor apertures, "it would be obvious to one skilled in the art to have the diffuse sensor have a greater flux capability than the specular light sensor due to the diffuse beams being in a flame-like scattering of a Lambertian distribution. As for the size of the aperture, it would be obvious to one skilled in the art that the diffuse sensor's aperture has to be larger in regards to one direction compared to the specular light sensor in order to guarantee acceptance of the Lambertian distribution."

The Office Action also relies on the fact that Walker et al. references the differences in light spread between diffuse and specular light reflections to support the conclusion that one skilled in the art would thereby find it obvious to now modify Walker et al. to have different light flux capabilities between the diffuse and specular light sensors.

However, the following is noted.

As detailed in the background of the present application, the conventional methodology is exhaustively based on ratio tables, where the fact that the specular and diffuse light reflections have different light spreads is already taken into consideration. In fact it is relied upon. The present application further points to Minerd et al., U.S. Patent No. 4,540,887, and Courtney, U.S. Patent No. 5,139,339, which particularly point out that conventional technique of taking a ratio of the two sensor values. Walker et al. further details that conventionally such a ratio system was implemented. See Walker et al. in col. 6, lines 1-18.

Based on the proposal of the Office Action, it would have been obvious throughout the time the differences between specular and diffuse light spreads has been known to make this change to the standard conventional methodology.

However, as evidenced through the background of the present application, the prior art search performed by the Examiner, and even the disclosure of Walker et al., these similar operating media type detectors would appear to not have come to the same conclusion.

Further, it would appear that only the present application discusses the problems associated with such systems.

Thus, the differences between specular and diffuse light reflections is well known, and has been well known. Therefore, it is respectfully submitted that since the Examiner's proffered solution has not previously been derived, before the presently claimed invention, then the same is not obvious.

Also, as different surfaces have different reflective properties, some surfaces will produce differing levels of specular and/or diffuse light reflections. Thus, though the proffered modification of Walker et al. could be appropriate for some surfaces the proffered modification may not be appropriate for others.

Thus, in view of the above, it is respectfully submitted that it would not have been obvious to modify Walker et al. to include the proffered different flux capabilities.

In addition, it is respectfully submitted that the outstanding obviousness rejection fails to meet a prima facie obviousness standard.

Both the motivation for making the modification of Walker et al. and the corresponding different light flux capabilities are not supported by concrete evidence in the record, but are merely the resultant conclusion of the Examiner. Further, it would appear that the differing light flux capabilities the Office Action is proposing to modify into Walker et al. can only be found in the presently claimed invention.

MPEP § 2142 states that "[w]hen the motivation to combine the teachings of the references is not immediately apparent, it is the duty of the Examiner to explain why the combination of the teachings is proper." The Examiner is required to present actual evidence and make particular findings related to the motivation to combine the teachings of the references. In re Kotzab, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); In re Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

The mere fact, however, that the prior art may be modified in the manner suggested in the Office Action does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F. 2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992).

Further, it is well settled that "the Board [and Examiner] cannot simply reach conclusions based on [their] own understanding of experience - or on [their] assessment of what would be basic knowledge or common sense. Rather the Board must point to some concrete evidence in the record in support of these findings." In re Zurko, 258 F. 3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). See also In re Lee, 277 F. 3d 1338, 1344-45, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002), in which the court required evidence for the determination of unpatentability by clarifying that the principles of "*common knowledge*" and "*common sense*" may only be applied to the analysis of evidence, rather than be a substitute for evidence. The court has also recently expanded their reasoning on this topic in In re Thrift, 298 F. 3d 1357, 1363, 63 USPQ2d 2002, 2008 (Fed. Cir. 2002).

Thus, accordingly, a prima facie obviousness rejection requires concrete evidence of motivation from something in the record that would lead one skilled in the art to combine the relevant teachings.

Again, it is respectfully submitted that only the presently claimed invention has proposed the claimed different light flux capabilities. Further, the Office Action is lacking in the required concrete support for the proffered motivation. As noted above, the underlying differences between diffuse and specular light reflections are well known, and till the presently claimed invention it would not appear that the claimed different light flux capabilities have been derived.

Therefore, to overcome this inherent non-obviousness, it is respectfully submitted the underlying rationale for modifying Walker et al. to include such light sensors with different light flux capabilities must be more concrete than the proposed rationale of compensating for the inherent differences between diffuse and specular reflections.

Lastly, it is noted that if the Office Action is relying on Official Notice to support the disclosure of light sensors with different light flux capabilities, applicants respectfully request the production of the same. As noted above, it would appear that the these light sensors with different light flux capabilities are not supported by the record, and definitely not notoriously well known.

Therefore, for at least the above, it is respectfully requested that rejections to claims 1, 5, 6, 10-13 and 18-20 be withdrawn and claims 1, 5, 6, 10-13 and 18-20 be allowed. In addition, it is respectfully submitted that the remaining independent claims, which include such light flux capability features, are also allowable for at least the same reasoning.

Claim 14 stand rejected under 35 USC § 103 as being obvious over Walker et al., in view of Snail, U.S. Patent No. 4,815,858, and Howarth, U.S. Patent No. 4,319,847. This rejection is respectfully traversed.

It is respectfully submitted that dependent claim 14 is at least allowable for depending from an allowable base claim.

In addition, the Office Action suggests that it would have been obvious to modify Walker et al. to include a semicircular cavity "for semicircular cavities are used in reflectometry and measuring of sheets."

However, it is respectfully submitted that the proffered motivation still fails to provide the suggestion as to why one skilled in the art would include a semicircular cavity in the particular system of Walker et al., as the same would not appear necessary or desired and Walker et al. would not even appear accepting of such a modification.

As illustrated in FIGS. 4-8 and 21-24 of Walker et al., the sensor system of Walker et al. includes complex lenses and particularly oriented apertures to focus a diffuse detected light and a specular detected light to two separate distant sensors. Conversely, the systems in Howarth and Snail would appear to be of quite simpler configurations, i.e., a singular detector to detect a majority of light reflecting of a surface, regardless of whether the light is diffuse or specular. Thus, the fact that the semicircular cavity is appropriate for each of Howarth and Snail does not automatically mean that the same is appropriate for Walker et al. Further, as noted above, Walker et al. already has a complex system for differentiating between the diffuse and specular reflections, and thus would not need such a semicircular cavity modification.

In addition, it is not clear whether Walker et al. would even operate as intended if modified, as suggested. Both Howarth and Snail would appear to be more interested in collecting a large amount of light, regardless of whether that light is a diffuse or specular light reflection. Conversely, Walker et al. is more interested in differentiating the diffuse and specular reflections. Thus, if the semicircular cavity of Howarth and Snail was incorporated into Walker et al., Walker et al. may not be able to sufficiently discern between the diffuse and specular light reflections.

Thus, it is respectfully submitted that the proffered motivation for modifying Walker et al. fails to provide concrete evidence leading/suggesting the actual modification of Walker et al. to incorporate a semicircular cavity. Further, Walker et al. would actually appear to lead away from such a modification, since there already is a complex focusing system for discerning between diffuse and specular reflections.

Therefore, for at least the above, it is respectfully requested that this rejection be withdrawn.

Claims 15-17 stand rejected under 35 USC § 103 as being obvious over Walker et al., in view of Howarth and Yanagiuchi, U.S. Patent No. 6,677,603. This rejection is respectfully traversed.

Similar to above, it is respectfully submitted that it would not have been obvious to modify Walker et al. to include the claimed: "wherein the first light sensor has a higher light flux capability compared to the specular light sensor." Therefore, the above comments regarding the nonobviousness of modifying Walker et al. and the lack of a prima facie obviousness case are respectfully incorporated herein.

In addition, the Office Action recites: "As for a linear characteristic range of a sensor, Walker is silent. Howarth teaches that for measuring characteristics of a media proper selection of the spectral response of the detector must be accomplished... Yanagiuchi in a medium discriminating device teaches having the intensity fall within the linear response of the sensor in order to guarantee a signal free of noise and adjusting the light source if the intensity does not fall within the linear characteristic... Therefore, it would have been obvious to one skilled in the art [that] the signal's intensity would fall within a linear characteristic range of the light sensor, for media produce differing linear signal responses upon illumination and that having the intensity fall within the linear response even through adjustment of the light source output demonstrates measurement free of noise and other perturbations within the system."

First, it is noted that the cited portion of Howarth references the need to have a proper selection of "the spectral frequency of the beam of radiation of the source 30 and the spectral response of the detector 42." This merely references the need to both match frequencies of the light source and detector and choose that frequency appropriately. This citation is unrelated to the presently claimed invention. The term "spectral" may have been misunderstood as being related to "specular."

The Office Action relies on Yanagiuchi to disclose the need to "have a light intensity fall within the linear response of the sensor in order to guarantee a signal free of noise and adjusting the light source if the intensity does not fall within the linear characteristic."

Independent claim 15 particularly recites: "wherein the first light sensor has a higher light flux capability compared to the specular light sensor," "such that, upon an illumination of a media, when a signal of a detected first light sensor intensity falls within a linear characteristic range of the first light sensor, a signal ratio of a detected specular light sensor intensity and the detected first light sensor signal is determinative of a media type of the media."

Thus, the light flux capability difference between the first light sensor and the specular light sensor is related to the light intensity linear characteristic.

Yanagiuchi would appear to merely illustrate a method of initializing sensors in a multi-wavelength media type detection system, based on a reference sheet, where the output of the light sources and light sensors can be adjusted so that a detected output of the multi-wavelength system conform with a reference output.

Although Yanagiuchi would not appear relevant to either Howarth or Walker et al., Yanagiuchi can be considered to illustrate a standard initialization of a system based on a reference sheet. Accordingly, light sources and light sensors can be adjusted so an output of the system matches a reference, when a reference sheet is evaluated.

However, neither Howarth nor Yanagiuchi would appear to disclose or suggest the claimed correspondence between the light flux capability difference of the first light sensor and the specular light sensor and the resultant light intensity linear characteristic. As claimed, there is a light flux capability difference between sensors such that a media type can be detected when the "signal of a detected first light sensor intensity falls within a linear characteristic range of the first light sensor."

Therefore, for at least the above, it is respectfully requested that this rejection of independent claim 15 be withdrawn and independent claim 15 be allowed. Similarly, for at least the above, it is respectfully submitted that claims depending from independent claim 15 are also in proper condition for allowance.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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